

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
UNDERGROUND INJECTION CONTROL**



**DRAFT Area UIC Permit No. UT22197-00000 Version 5**  
(Permit Modification No. 4)

Class II-R (enhanced recovery) Area Injection Well Permit for the Portion of the Greater Monument Butte Oil Field Located on the Uintah and Ouray Indian Reservation, Utah

Issued To

**Newfield Production Company**  
10530 South County Road 33  
Myton, Utah 84052

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## PART 1. AUTHORIZATION TO CONSTRUCT AND OPERATE

Under the authority of the Safe Drinking Water Act (SDWA) and Underground Injection Control (UIC) Program regulations of the U. S. Environmental Protection Agency (EPA), codified at Title 40 of the Code of Federal Regulations (40 CFR) Parts 2, 124, 144, 146, and 147, Newfield Production Company (hereafter “Permittee”) is authorized to construct and operate Class II-R (enhanced recovery) injection wells according to the terms and conditions of this Permit in the portion of the Greater Monument Butte Field within the Uintah and Ouray Indian Reservation further described as and henceforth referred to as the Authorized Permit Area:

**T8S, R17E; T8S, R18E; T8S, R19E; T9S, R17E Except Sections 31 - 36; T9S, R18E Except Sections 25, 26, 27 and Section 31 - 36; Sections 4, 5, 6, 7, 8, 9, N2 17 & N2 18 T9S, R19E S.L.B. & M., Uintah & Duchesne Counties, Utah, except that any well in this area for which the Endangered Species Act section 7(a)(2) or National Historic Preservation Act section 106 compliance process has not been completed by a federal agency is excluded from coverage under this permit.**

Where a state or tribe is not authorized to administer the UIC program under the SDWA, the EPA regulates underground injection of fluids into wells so that injection does not endanger Underground Sources of Drinking Water (USDWs). The EPA UIC Permit conditions are based on authorities set forth at 40 CFR Parts 144 and 146, and address potential impacts to USDWs. Under 40 CFR Part 144, Subpart D, certain conditions apply to all UIC Permits and may be incorporated either expressly or by reference. Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege, nor does it authorize injury to persons or property or invasion of other private rights, or any infringement of other Federal, State or local laws or regulations (40 CFR §144.35). An EPA Class II UIC Permit may be issued for the operating life of the injection well or project. However, it will be reviewed at least once every five years to determine if action is required under 40 CFR §144.36(a). This Permit is issued for the life of the well(s) unless modified, revoked and reissued, or terminated pursuant to 40 CFR §144.33(d) or 144.40. This EPA Permit may be adopted, modified, revoked and reissued or terminated if primary enforcement authority for a UIC Program is transferred to an Indian tribe or state. Upon the effective date of program authorization, reports, notifications, questions and other correspondence should be directed to the primacy agency.

Issue Date: \_\_\_\_\_

Effective Date: \_\_\_\_\_

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Darcy O'Connor  
Acting Assistant Regional Administrator\*  
Office of Partnerships and Regulatory Assistance (OPRA)

\*NOTE: Throughout this Permit the term “Director” refers to either the Assistant Regional Administrator for the Office of Partnerships and Regulatory Assistance (OPRA) or the Assistant Regional Administrator of Environmental Compliance, Enforcement and Justice (ECEJ).

## PART 2. TRANSFER OF EXISTING CLASS II-R UIC PERMITS

Upon issuance of Final Area UIC Permit No. UT22197-00000 (Area UIC Permit UT22197-00000), all existing Class II-R UIC permits issued to the Permittee for wells within the Authorized Permit Area are revoked and authorization for those wells will be reissued under UIC Permit UT22197-00000. The first five numeric characters of each previously issued permit number will change to “22197” denoting authorization under Area UIC Permit UT22197-00000. The last five digits of previously issued permit numbers, referred to as the “well ID,” will remain the same.

## PART 3. QUARTERLY REPORTING REQUIREMENTS

1. **New Wells in Area of Review:** The Permittee shall notify the Director quarterly of all newly drilled oil-gas wells within the Authorized Permit Area and within a ¼-mile of the Authorized Permit Area, including wells with surface location beyond ¼-mile that penetrate the Confining Zone within the ¼-mile radius of the Authorized Permit Area. Such notice should be mailed to:

UIC Permit Coordinator (8P-W-UIC)  
1595 Wynkoop Street  
Denver, Colorado 80202

The quarterly due dates for this information shall be the first weekday (Monday-Friday) that is not a federal holiday of the following months: January, April, July and October. Such notification shall include:

- a. a list of all newly drilled wells including their names, API numbers, location, ownership, purpose (for example, oil production, gas production, etc.) and the Permittee’s determination of whether that well is located within the Authorized Permit Area or within ¼-mile of the Authorized Permit Area;
  - b. a well bore schematic diagram for each newly drilled production well; and
  - c. a cement bond log for each newly drilled production well showing the presence or absence of cement behind the outermost casing string across the designated Confining Zone for Area UIC Permit UT22197-00000; and
  - d. an updated map of the Authorized Permit Area showing the surface location and down hole location of all wells.
2. **Financial Responsibility:** The Permittee shall submit a quarterly update of its financial responsibility demonstration to:

UIC Financial Responsibility Coordinator (8ENF-UFO)  
1595 Wynkoop Street  
Denver, CO 80202

Quarters shall be defined as follows: January 1- March 31 (Q1), April 1 – June 30 (Q2), July 1 – September 30 (Q3), and October 1 – December 31 (Q4). Due dates for this information shall be the first weekday (Monday - Friday) of each quarterly period that is not a Federal holiday. The quarterly update shall include:

- a. the total number, names and API numbers of injection wells authorized for construction by the Director during the previous quarter;
- b. the total number, names and API numbers of injection wells to be requested for construction authorization by the Director during the current quarter; and
- c. an approved instrument revising the amount of the financial responsibility demonstration and a revised Schedule A if any wells to be requested for construction authorization by the Director in the current quarter are not currently covered.

## **PART 4. REQUIREMENTS FOR ADDING INJECTION WELLS TO AREA UIC PERMIT UT22197-00000**

The Permittee shall not convert production wells to injection wells or commence injection into wells until Permittee has been approved to do so in accordance with the following procedures:

1. **Authorization to Construct:** Prior to converting an existing production well to an injection well, the Permittee shall submit the following materials to the UIC Permit Coordinator:
  - a. a cover letter requesting authorization to convert the well referencing Area UIC Permit UT22197-00000 and the name and API number of the well;
  - b. a completed EPA 7520-6 injection well application form;
  - c. a wellbore diagram of the proposed injection well;
  - d. evidence and/or a written statement that water feed lines have been installed to the requested well or are approved for installation by the Bureau of Land Management (BLM) and that the Permittee has the ability and intention to convert the production well to an injection well within 90 calendar days of receiving EPA authorization;
  - e. a laboratory analysis of formation fluid produced from the subject well(s) or a statement that the water sample will be obtained during well construction and submitted under Part 4, paragraph 2(f) of this Permit;
  - f. a topographic map extending to at least ¼-mile radius Area of Review (AOR) for the well;
  - g. a listing of all wells penetrating the Confining Zone within the ¼-mile AOR and cementing records, including Cement Bond Logs, for any new wells within the ¼-mile AOR not previously evaluated by the EPA; and
  - h. a well location plat map for the requested injection well.

Once EPA has confirmed that the proposed injection well meets the Permit conditions, EPA Region 8 will authorize construction by email or other written communication to the Permittee. In addition, the construction authorization date for each well will be recorded in a List of Wells (LW), which is described below in Part 5.

2. **Injection Well Construction:** Area UIC Permit UT22197-00000 authorizes the Permittee to construct and test wells only in accordance with the terms and conditions of this Permit. The Permittee shall construct a requested injection well within 90 calendar days of the EPA construction authorization date, and shall notify the Director of the completed construction of an injection well as soon as possible but no later than 30 calendar days after the date that tubing and packer are set. Notification of well construction shall include:

- a. a cover letter referencing Area UIC Permit UT22197-00000 and the name and API number of the constructed injection well;
- b. an updated well bore schematic diagram;
- c. the results of a standard annulus pressure test and a statement of how mechanical integrity has been demonstrated according to Part 8 of this permit;
- d. an estimate of the pore pressure of the Garden Gulch Number 2 Sand incorporating best available analog well data or other available information, and including a short narrative description and calculations used to determine the estimate;
- e. the Maximum Allowable Injection Pressure (MAIP) calculated for the well including the calculation used to determine the MAIP according to Part 11 of this Permit; and
- f. if not already submitted under Part 4, paragraph 1(e) of this Permit, a laboratory analysis of formation fluid produced from the subject well(s).

EPA will review these materials to ensure that Permit conditions were complied with during well construction and that planned operating parameters are in full compliance with Area UIC Permit UT22197-00000. EPA Region 8 will authorize injection by email or other written correspondence when: 1) it is satisfied that all permit conditions have been met and 2) it has determined that the formation water quality at the subject well is not a USDW. If EPA finds, based on the formation water quality, that the receiving aquifer is a USDW, the Permittee, prior to receiving authorization to inject, will need to request and receive an aquifer exemption pursuant to 40 CFR section 146.4. Following EPA authorization to inject, the injection authorization date will be recorded in the LW, which is described below in Part 5.

3. **Commencement of Injection:** Initial injection shall commence no later than 30 calendar days following the EPA injection authorization. The Permittee shall notify the Director as soon as possible but no more than 30 calendar days after placing the well on injection. Such notification shall include:
  - a. a statement of the date the well was put on injection;
  - b. a statement of the MAIP for the well; and
  - c. a statement of any required injection logs or tests that will be conducted, as required by EPA (for example, radioactive tracer survey or temperature log).

All injection logs or tests required by Part 8, 3(b) of this permit and referenced above in Part 4, 3(c), shall be completed within 180 calendar days of commencement of injection unless the Permittee requests and EPA provides written notification of an extension approval. Once EPA has reviewed and approved the log or test, and is satisfied that all permit conditions have been met, EPA Region 8 will provide written notification of approval to the Permittee by email or other written correspondence.

## **PART 5. LIST OF WELLS (LW) FOR AREA UIC PERMIT UT22197-00000**

Due to the large scope of Area UIC Permit UT22197, EPA intends to record information related to this permit in a database called the List of Wells for Area UIC Permit UT22197-00000 (LW). The LW is solely intended to serve as an administrative tool to organize and communicate oil-gas well data and other information related to Area UIC Permit UT22197-00000. It is maintained by EPA Region 8 and

available to the Permittee and the public upon request. Injection wells regulated by EPA and subject to the terms and conditions of this Permit are listed in the LW with EPA Permit number UT22197 and are assigned a unique well identification number by EPA.

## **PART 6. DRILLING OF INJECTION WELLS**

The drilling of injection wells is not authorized under this permit. The Permittee shall notify the Director at such time the Permittee wishes to drill an injection well and request a permit modification to Area UIC Permit UT22197-00000. Any such permit modification will require compliance with the process at 40 CFR section 144.39, including public notice and comment.

## **PART 7. INJECTION WELL CONSTRUCTION REQUIREMENTS**

These requirements represent the approved minimum construction standards for well casing and cement, well head configuration, injection tubing and packer. Deviation from the approved construction standards without prior approval from the Director is prohibited.

1. **Casing and Cement:** Injection wells shall be cased and cemented to prevent the movement of fluids into or between USDWs. The well casing and cement shall be designed for the life expectancy of the well. Remedial cementing may be required if shown to be inadequate by cement bond log or other attempted demonstration of Part II (external) mechanical integrity.
  - a. Any production well added to Area UIC Permit UT22197-00000 as an injection well must have surface casing set to least 50 feet below the lowermost USDW determined in accordance with Utah State Technical Publication 92, *The base of moderately saline water in the Uinta Basin, Utah* by Lewis Howells, M.S. Longson, and G.L. Hunt.
  - b. Long string casing shall be adequately cemented to at least above the base of the Confining Zone or a regular Part II (external) mechanical integrity demonstration by an approved Part II testing method is required. The depth of top of cement shall be demonstrated by cement bond log and is subject to approval by the Director.
  - c. The Permittee shall not perforate uncemented intervals of long string casing in any injection well except to squeeze cement as required to meet the conditions of this Permit.
2. **Injection Tubing and Packer:** Injection tubing and packer are required on all injection wells authorized under Area UIC Permit UT22197-00000. The shallowest packer shall be set within 100 feet above the shallowest open perforation.
3. **Sampling and Monitoring Devices on the Well Head:** The Permittee shall install and maintain in good operating condition:
  - a. a "tap" at a conveniently accessible location on the injection flow line between the pump house or storage tanks and the injection well, isolated by shut-off valves, for collection of representative samples of the injected fluid; and
  - b. a one-half (1/2) inch female iron pipe fitting, isolated by shut-off valves and located at the wellhead at a conveniently accessible location, for the attachment of a pressure gauge capable of

monitoring pressures ranging from normal operating pressures up to the Maximum Allowable Injection Pressure:

- (1) on the injection tubing;
- (2) on the Tubing-Casing Annulus (TCA); and
- c. a pressure actuated shut-off device attached to the injection flow line set to shut-off flow from the injection pump when or before the Maximum Allowable Injection Pressure (MAIP) is reached at the wellhead in the injection tubing string(s); and
- d. a non-resettable cumulative volume recorder attached to the injection line(s).

## **PART 8. MECHANICAL INTEGRITY OF INJECTION WELLS**

The Permittee shall maintain the mechanical integrity of all injection wells under Area UIC Permit UT22197-00000 at all times and as specified by the EPA. Injecting into a well that lacks mechanical integrity is prohibited.

1. **Definition of Mechanical Integrity:** An injection well has mechanical integrity if:
  - a. there is no significant leak in the casing, tubing, or packer (Part I); and
  - b. there is no significant fluid movement into a USDW through vertical channels adjacent to the injection well bore (Part II).
2. **Mechanical Integrity Demonstration Requirements:** The Permittee shall demonstrate Part I (internal) mechanical integrity prior to commencing injection and periodically thereafter as described in Part 8, 3(a) below or as required the Director. The Permittee shall demonstrate Part II (external) mechanical integrity according to Part 8, 3(b) no greater than 180 days following commencement of injection or as required by the Director. The Director may require additional or alternative tests if the results presented by the operator are not satisfactory to the Director to demonstrate mechanical integrity. Results of mechanical integrity tests shall be submitted to the Director as soon as possible but no more than 30 calendar days after the test is complete.
3. **Approved Methods for Demonstrating Mechanical Integrity:**
  - a. Part I (Internal) mechanical integrity shall be demonstrated prior to commencement of injection and this demonstration shall be repeated no less than once every five years after the last demonstration. Any injection well requiring the use of Angard or any other annulus plugging gel or corrective measure to pass a Part I mechanical integrity test shall have a Part I mechanical integrity demonstration conducted no less than once every 365 calendar days. Part I mechanical integrity shall be demonstrated by a standard annulus pressure test or other method approved by the Director.
  - b. Part II (External) mechanical integrity shall be demonstrated by:
    - (1) a Cement Bond Log (CBL) that the Director determines to show a sufficient interval of 80



percent cement bond index compressive strength or greater within the designated Confining Zone; or

(2) a Radioactive Tracer Survey (RTS) showing the absence of fluid movement through vertical channels adjacent to the well bore at or near the shallowest perforation accepting fluid, to be repeated at a frequency not to exceed five years after the last RTS showing the absence of fluid movement through vertical channels adjacent to the wellbore at or near the shallowest perforations accepting fluid. The RTS shall supplement a CBL on file with the EPA showing top of cement above the base of the designated Confining Zone but an insufficient interval of 80 percent cement bond index compressive strength or greater through the designated Confining Zone; or

(3) other approved Part II mechanical integrity demonstration method including a temperature log, oxygen activation log, or noise log that shall be repeated no less than once every five years.

c. EPA approved methods shall be used to demonstrate mechanical integrity. EPA Region 8<sup>1</sup> Ground Water Section Guidance No. 34 "Cement Bond Logging Techniques and Interpretation", Ground Water Section Guidance No. 37, "Demonstrating Part II (External) Mechanical Integrity for a Class II injection well permit", and Ground Water Section Guidance No. 39, "Pressure Testing Injection Wells for Part I (Internal) Mechanical Integrity" as well as guidelines for conducting radioactive tracer surveys are available at <http://www.epa.gov/uic/underground-injection-control-epa-region-8-co-mt-nd-sd-ut-and-wy> or copies will be provided upon request.

4. **Notification of Mechanical Integrity Testing:** At least once each calendar year, the Permittee shall report to the UIC Enforcement Coordinator a list of planned mechanical integrity tests during each of the next 52 week-long periods; this annual notification shall delineate 52 Monday through Friday periods and list the well names and EPA well IDs the Permittee anticipates testing for mechanical integrity each week. It is the Permittee's responsibility to ensure that mechanical integrity demonstration on all wells is conducted in accordance with Area UIC Permit UT22197-00000 and that all mechanical integrity test results are submitted to the Director as soon as possible but no more than 30 calendar days from completion.

5. **Loss of Mechanical Integrity:** If the Permittee fails to demonstrate mechanical integrity during a test or a loss of mechanical integrity becomes evident during operation (such as presence of abnormal<sup>2</sup> pressure in the Tubing-Casing Annulus (TCA), water flowing at the surface, etc.), the Permittee shall notify the Director within 24 hours (see Part 17, Paragraph 17(e) of this Permit) and the well shall be shut-in within 48 hours unless the Director requires immediate shut-in. Within five calendar days of discovering the loss of mechanical integrity, the Permittee shall submit a written report that documents the circumstances and repairs undertaken or a proposed remedial action plan. Injection operations shall not be resumed until after the well has successfully been repaired, has demonstrated mechanical integrity and the Permittee has received written notification from the Director. A demonstration of mechanical integrity shall be re-established within 90 days of any loss

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<sup>1</sup> EPA headquarters in Washington, D.C. issues national UIC Guidance documents with numbers that do not correspond to EPA Region 8 UIC Guidance documents. These may be found at <http://water.epa.gov/type/groundwater/uic/guidance.cfm>

<sup>2</sup> Abnormal pressure on the tubing-casing annulus is 100 psig or 10 percent of the injection tubing pressure, whichever is less.

of mechanical integrity unless written approval of an alternate time period has been given by the Director.

## **PART 9. PROCEDURES FOR WELL LOGGING AND TESTING**

The Permittee shall:

1. conduct all logs and tests according to EPA approved procedures at <http://www.epa.gov/uic/underground-injection-control-epa-region-8-co-mt-nd-sd-ut-and-wy>;
2. submit all logging and testing results to the Director for review within 30 calendar days of completion of the logging or testing activity;
3. include with any data and test results, a report describing the methods used during logging or testing and an interpretation of the test or log results by a qualified log or test analyst; and
4. submit initially required logs and test data associated with injection well conversions to the EPA Region 8's Office of Partnerships and Regulatory Assistance at the following address:

UIC Permit Coordinator, 8P-W-UIC  
1595 Wynkoop Street  
Denver, CO 80202-1129.

Thereafter, Permittee shall submit periodically required injection well logs and tests to the EPA Region 8's UIC Technical Enforcement Program at the following address:

UIC Enforcement Coordinator, 8ENF-UFO  
1595 Wynkoop Street  
Denver, CO 80202-1129

## **PART 10. REQUIREMENTS FOR OPERATING INJECTION WELLS**

1. **Injection Zone:** An *injection zone* is a geological formation, group of formations, or part of a formation that receives fluids through a well. The Injection Zone for Area UIC Permit UT22197-00000 consists of the lower part of the Garden Gulch member starting at the top of the Garden Gulch #2 Sand and includes the Douglas Creek and Basal Carbonate members of the Green River Formation to the top of the Wasatch Formation. The Injection Zone is located between the depths of 4,466 and 6,514 feet in the Federal 1-26-8-17 Type Gamma Log for the Monument Butte Field. For each well authorized by UT22197-00000, the Permittee is authorized to perforate casing and emplace fluids only within the stratigraphic interval designated as the Injection Zone.
2. **Confining Zone:** A *Confining Zone* is a geological formation, group of formations, or part of a formation that is capable of limiting fluid movement above an injection zone. The designated Confining Zone for Area UIC Permit UT22197-00000 consists of three interbedded, thick shales, confining marlstones and siltstones. The Confining Zone extends from approximately 200 feet above

the Garden Gulch Marker to the top of the Garden Gulch Number 2 Sand within the Garden Gulch Member of the Green River Formation. This interval is found between the depths of 3,970 feet to 4,466 feet in the Federal 1-26-8-17 Type Gamma Log for the Monument Butte Field.

3. **Injection Volume Limitation:** The volume of approved Class II fluids injected for the purpose of enhanced recovery is not limited by this Permit.
4. **Injection Fluid Limitation:** Area UIC Permit UT22197-00000 authorizes the injection of produced Green River Formation water commingled with water from the Green River and/or municipal water from the Johnson Water District. The Permittee shall provide an annual listing of sources of injected fluids in accordance with the reporting requirements in Part 14, Paragraph 4 of this Permit. Injection of any fluid for the purpose of disposal is prohibited. Prohibited fluids include unused fracturing fluids or acids, gas plant cooling tower cleaning wastes, service wastes, and vacuum truck and drum rinsate from trucks and drums transporting or containing non-exempt waste.
5. **Tubing-Casing Annulus (TCA):** The TCA shall be filled with water treated with a corrosion inhibitor or other fluid approved by the Director. The TCA valve shall remain closed during normal operating conditions and the TCA pressure shall be maintained at zero (0) psi. If TCA pressure cannot be maintained at zero (0) psi, the Permittee shall follow the procedures in Ground Water Section Guidance No. 35 "Procedures to follow when excessive annular pressure is observed on a well."

## **PART 11. MAXIMUM ALLOWABLE INJECTION PRESSURE (MAIP)**

Except during well stimulation, the injection pressure as measured at the surface, shall not exceed the MAIP. The Permittee shall calculate the MAIP based on the following equation and using the table of values in Part 19 of this Permit:

$$\text{MAIP} = [\text{FG} - (0.433)(\text{SG})] * \text{Depth},$$

Where "Depth" is the depth in feet to the shallowest perforation in the long string casing from the Kelly Bushing and "FG" and "SG" shall be determined for each well using the table in Part 19 of this Permit. The Permittee may submit information identifying a suite of fracture gradients to justify an increase or decrease of the fracture gradient for any of 65 Fracture Gradient Area Numbers listed in Part 19 of this Permit. Any such increase or decrease will require a permit modification in accordance with 40 CFR §144.39.

## **PART 12. AREA OF REVIEW (AOR) WELL REQUIREMENTS**

All wells located within a ¼-mile radius of an injection well shall have top of cement behind the outermost casing string at the depths of the Injection and Confining Zones at least above the base of the designated Confining Zone, unless the AOR well is an EPA-authorized injection well with a demonstration of part II (external) mechanical integrity. As required under Part 4 of this Permit (Process for Adding Injection wells to Area UIC Permit UT22197-00000), the Permittee shall identify all wells penetrating the Confining Zone within a ¼-mile radius of a requested injection well and provide a

cement bond log for any production well that EPA has not previously evaluated. Plugged and abandoned wells in the AOR of an injection well shall either have cement behind the outermost casing string above the base of the Confining Zone or in the case of uncased, drilled and abandoned wells that penetrate the injection zone, shall have a cement plug that isolates the injection zone from USDWs.

## **PART 13. REQUIREMENTS FOR WORKOVERS AND ALTERATIONS**

1. **Definition:** Any addition, physical alteration or activity that may affect tubing, packer or casing is a well rework activity covered under Part 13 of this Permit. Workovers include well stimulation activities such as hydraulic fracturing, polymer gel injection and the delivery of acid to the injection zone formation. EPA Region 8 does not consider the temporary filling of the wellbore with acid to descale tubulars, or the use of biocides to prevent algal growth, to constitute a well rework.
2. **Procedures:** Workovers and alterations to the injection well shall meet all conditions of Area UIC Permit UT22197-00000. Prior to beginning any well rework activity, the Permittee shall give advance notice to the Director. Such notice may be given via email correspondence, faxed letter or post. The Permittee shall record all workovers and changes to well construction on a Well Rework Record (EPA Form 7520-12) and when appropriate, provide an updated well bore diagram, and shall provide this and any other record of well workover, including monitoring, logging or test data to the Director within 30 calendar days of completion of the activity.
3. **Re-establishing Mechanical Integrity:** A successful demonstration of Part I (internal) mechanical integrity is required following the completion of any well workover, well stimulation or alteration which affects the casing, tubing, or packer, or exceeds the MAIP for the well. Injection operations shall not be resumed until the well has successfully demonstrated Part I mechanical integrity, and if the well lost mechanical integrity, the Director has provided written notice.

## **PART 14. MONITORING, RECORDKEEPING AND REPORTING OF RESULTS**

1. **Monitoring Parameters, Frequency, Records and Reports:** Monitoring parameters are specified in Table 1 of this Permit. Pressure monitoring recordings shall be taken at the wellhead. The listed parameters are to be monitored, recorded and reported at the frequency indicated in Table 1 even during periods when the well is not operating.

**Table 1: Monitoring and reporting requirements for injection wells**

<b>Observe monthly and record at least once every 30 days</b>	
<b>Observe and Record</b>	Injection pressure (psig)
	Annulus pressure(s) (psig)
	Injection rate (bbl/day)
	Fluid volume injected since the well began injecting (bbls)
<b>Annually</b>	
<b>Analyze</b>	Injected fluid total dissolved solids (mg/l)
	Injected fluid specific gravity
	Injected fluid specific conductivity
	Injected fluid pH
<b>Annually</b>	
<b>Report</b>	Each month's maximum and averaged injection pressures (psig)
	Each month's maximum and minimum annulus pressure(s) (psig)
	Each month's injected volume (bbl)
	Fluid volume injected since the well began injecting (bbls)
	Written results of annual injected fluid analysis
	Sources of all fluid injected during the year

Monitoring records shall include:

- a. the date, time, exact place and the results of the observation, sampling, measurement, or analysis;
  - b. the name of the individual(s) who performed the observation, sampling, measurement, or analysis; and
  - c. the analytical techniques or methods used for analysis.
2. **Monitoring Methods:** Monitoring observations, measurements, samples, etc. taken for the purpose of complying with these requirements shall be representative of the activity or condition being monitored. Methods used to monitor the nature of the injected fluids must comply with analytical methods cited and described in Table 1 of 40 CFR 136.3 or Appendix III of 40 CFR part 261, or by other methods that have been approved in writing by the Director.

Injection pressure, annulus pressure, injection rate, and cumulative injected volumes shall be observed and recorded at the wellhead under normal operating conditions, and all parameters shall be observed simultaneously to provide a clear depiction of well operation. Pressures are to be measured in pounds per square inch (psi). Fluid volumes are to be measured in standard oil field barrels (bbl). Fluid rates are to be measured in barrels per day (bbl/day).

3. **Records Retention:** Records of calibration and maintenance, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained for a period of at least three years from the date of the sample, measurement, report, or application. This period may be extended any time prior to its expiration by request of the Director. Records of the nature and composition of all injected fluids must be retained until three years after the completion of any plugging and abandonment procedures specified under 40 CFR section 144.52(a)(6) or under Part

146 Subpart G, as appropriate. The Director may require the Permittee to deliver the records to the Director at the conclusion of the retention period. The Permittee shall continue to retain the records after the three year retention period unless the Permittee delivers the records to the Director or obtains written approval from the Director to discard the records.

4. **Annual Reports:** Regardless of whether the well is operating or not, the Permittee shall submit an Annual Report to the UIC Enforcement Coordinator in Part 9, 4(b) of this Permit that summarizes the results of the monitoring required by Part 14, Paragraph 1 and Table 2 of this Permit. The report of all sources of the fluids injected during the year must identify each source by the generator's name and the well name and location, and the field name or facility name. The first Annual Report shall cover the period from the effective date of the Permit through December 31 of that year. Subsequent Annual Reports shall cover the period from January 1 through December 31 of the reporting year. Annual Reports shall be submitted by February 15 of the year following data collection. EPA Form 7520-11 may be copied and shall be used to submit the Annual Report. However, the monitoring requirements specified in this Permit are mandatory even if EPA Form 7520-11 indicates otherwise.

## **PART 15. INACTIVE INJECTION WELLS AND CONVERTING INJECTION WELLS TO NON-INJECTION WELLS**

1. **Inactive Injection Wells:** After any period of two years during which there is no injection, the Permittee shall plug and abandon the well in accordance with Part 16 of this Permit unless:
  - a. The Permittee provides written notice to the Director; and
  - b. describes the actions or procedures that will be taken to ensure the well will not endanger USDWs during the period of inactivity, including compliance with mechanical integrity demonstration, financial responsibility and all other permit requirements; and
  - c. receives written notice by the Director temporarily waiving plugging and abandonment requirements.
2. **Conversions to Non-Injection Wells:** The Director may, for cause or upon a written request from the Permittee, allow conversion of the well from a Class II injection well to a non-Class II well. Conversion may not proceed until the Permittee receives written approval from the Director. Conditions of such conversion may include but are not limited to, approval of the proposed well rework, follow up demonstration of mechanical integrity, well-specific monitoring and reporting following the conversion, and demonstration of practical use of the converted configuration.

## **PART 16. PLUGGING AND ABANDONMENT REQUIREMENTS**

1. **Notification of Well Abandonment and Project Closure:** The Permittee shall notify the Director in writing at least forty five calendar days prior to plugging and abandoning an injection well and the closure of the Monument Butte Field enhanced oil recovery project.
2. **Well Plugging Requirements:** Injection wells shall be plugged with cement in a manner which isolates the injection zone and prevents the movement of fluids into or between underground sources of drinking water and in accordance with 40 CFR §146.10. Tubing, packer and other down hole

apparatus shall be removed. Cement with additives such as accelerators and retarders that control or enhance cement properties may be used for plugs; however, volume-extending additives and gel cements are not approved for plug use. If cement retainers or bridge plugs are not used then plug placement shall be verified by tagging. Plugging gel of at least 9.0 lb/gal shall be placed between all plugs. A minimum 50 ft. surface plug shall be set inside the long string casing to seal pathways for fluid migration into the subsurface. The Plugging Record must be certified as accurate and complete by the person responsible for the plugging operation. Prior to placement of the cement plug(s) the well shall be in a state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method.

### 3. **Approved Plugging and Abandonment Plan**

In addition to the requirements in Part 16, paragraph two, the Permittee shall:

- a. **Isolate the injection zone:** Remove down hole apparatus from the well and perform necessary clean out; displace well fluid with plugging gel. Set a cast iron bridge plug (CIBP) within the innermost casing string no more than 50 ft. above the top perforation with a minimum of 20 ft. cement plug on top of the CIBP.
- b. **Isolate the Trona-Bird's Nest water zone and Mahogany Oil Shale:** Perforate and squeeze cement up the backside of the outermost casing string across the Mahogany Oil Shale and Trona-Bird's Nest water zone, from at least 55 ft. above the top of the Trona-Bird's Nest to at least 55 ft. below the base of Mahogany Oil Shale, unless there is existing cement across this interval.
- c. **Isolate the Uinta Formation from the Green River Formation:** Perforate and squeeze a minimum of 110 ft. cement up the backside of the outermost casing string to isolate the contact between the Uinta Formation and the Green River Formation, unless there is existing cement across this interval. Set a minimum 110 ft. cement plug in the innermost casing string, centered on the contact between the Green River Formation and Uinta Formation.
- d. **Isolate Surface Fluid Migration Paths:**
  - (1) If the depth of the lowermost USDW is above the base of surface casing, perforate the outermost casing string 50 ft. below the base of surface casing and circulate cement to the surface, unless there is existing cement across this interval; or
  - (2) If the depth of the lowermost USDW is below the base of surface casing, perforate the outermost casing string 50 ft. below the base of the lowermost USDW and circulate cement to surface; and
  - (3) Set a cement plug inside the innermost casing string from 50 ft. below the base of the surface casing to surface.

**Plugging and Abandonment Report:** Within sixty calendar days after plugging a well, the Permittee shall submit a report (EPA Form 7520-13) and a well bore diagram of the plugged well to the Director. The plugging report shall be certified as accurate by the person who performed the plugging operation. The report shall consist of either:

- a. statement that the well was plugged in accordance with the approved plugging and abandonment plan; or

- b. where actual plugging differed from the approved plugging and abandonment plan, an updated version of the plan, on the form supplied by the Director, specifying the differences.

## **PART 17. CONDITIONS APPLICABLE TO ALL PERMITS**

1. **Effect of Permit:** The Permittee is allowed to engage in underground injection in accordance with the conditions of this Permit. The Permittee shall not construct, operate, maintain, convert, plug, abandon, or conduct any other activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR part 141 or may otherwise adversely affect the health of persons. Any underground injection activity not authorized by this Permit or by rule is prohibited. Issuance of this Permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of any other Federal, State or local law or regulations. Compliance with the terms of this Permit does not constitute a defense to any enforcement action brought under the provisions of Section 1431 of the Safe Drinking Water Act (SDWA) or any other law governing protection of public health or the environment, for any imminent and substantial endangerment to human health or the environment, nor does it serve as a shield to the Permittee's independent obligation to comply with all UIC regulations. Nothing in this Permit relieves the Permittee of any duties under applicable regulations.
2. **Modification, Reissuance, or Termination:** The Director may, for cause or upon a request from the Permittee, modify, revoke and reissue, or terminate this Permit in accordance with 40 CFR §124.5, 144.12, 144.39, and 144.40. Also, this Permit is subject to minor modification for causes as specified in 40 CFR 144.41. The filing of a request for modification, revocation and reissuance, termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any condition of this Permit.
3. **Transfer of Permit:** Under 40 CFR 144.38, this Permit is transferable provided the current Permittee notifies the Director at least 30 calendar days in advance of the proposed transfer date (EPA Form 7520-7) and provides a written agreement between the existing and new Permittees containing a specific date for transfer of Permit responsibility, coverage and liability between them. The notice shall adequately demonstrate that the financial responsibility requirements of 40 CFR 144.52(a)(7) will be met by the new Permittee. The Director may require modification or revocation and reissuance of the Permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the Safe Drinking Water Act; in some cases, modification or revocation and reissuance is mandatory.
4. **Permittee Change of Address:** Upon the Permittee's change of address, or whenever the operator changes the address where monitoring records are kept, the Permittee must provide written notice to the Director within 30 calendar days.
5. **Severability:** The Provisions of this Permit are severable, and if any provision of this Permit or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Permit shall not be affected thereby.



6. **Confidentiality:** In accordance with 40 CFR Part 2 and 40 CFR §144.5, information submitted to the EPA pursuant to this Permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, the EPA may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in 40 CFR Part 2 (Public Information). Claims of confidentiality for the following information will be denied: The name and address of the Permittee, and information which deals with the existence, absence or level of contaminants in drinking water.
7. **Duty to Comply:** The Permittee must comply with all conditions of this Permit. Any noncompliance constitutes a violation of the Safe Drinking Water Act (SDWA) and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application; except that the Permittee need not comply with the provisions of this Permit to the extent and for the duration such noncompliance is authorized in an emergency permit under 40 CFR 144.34. All violations of the SDWA may subject the Permittee to penalties and/or criminal prosecution as specified in Section 1423 of the SDWA.
8. **Duty to Reapply:** If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, under 40 CFR §144.37 the Permittee must apply for a new permit prior to the expiration date.
9. **Need to Halt or Reduce Activity Not a Defense:** It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.
10. **Duty to Mitigate:** The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Permit.
11. **Proper Operation and Maintenance:** The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit.
12. **Permit Actions:** This Permit may be modified, revoked and reissued or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
13. **Property Rights:** This Permit does not convey any property rights of any sort, or any exclusive privilege.
14. **Duty to Provide Information:** The Permittee shall furnish to the Director, within a time specified, any information which the Director may request to determine whether cause exists for modifying,

revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this Permit. The Permittee is required to submit any information required by this Permit or by the Director to the mailing address designated in writing by the Director.

**15. Inspection and Entry:** The Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- a. enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;
- b. have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
- c. inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and
- d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the SDWA, any substances or parameters at any location.

**16. Signatory Requirements:** All applications, reports or other information submitted to the Director shall be signed and certified according to 40 CFR §144.32. This section explains the requirements for persons duly authorized to sign documents, and provides wording for required certification.

**17. Reporting Requirements:**

- a. The Permittee shall give prior notice to the Director as soon as possible of any planned changes, physical alterations or additions to the permitted facility.
- b. Anticipated noncompliance: The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- c. Monitoring Reports: Monitoring results shall be reported at the intervals specified in this Permit.
- d. Compliance schedules: Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Permit shall be submitted no later than 30 calendar days following each schedule date.
- e. Twenty-four hour reporting: The Permittee shall report to the Director any noncompliance which may endanger human health or the environment, including:

(1) Any monitoring or other information which indicates that any contaminant may cause endangerment to a USDW; or

(2) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between USDWs.

Information shall be provided, either directly or by leaving a message, within 24 hours from the time the permittee becomes aware of the circumstances by telephoning (800) 227-8917 and requesting the EPA Region 8 UIC Program Compliance and Technical Enforcement Director, or by contacting the EPA Region 8 Emergency Operations Center at (303) 293-1788.

In addition, a follow up written report shall be provided to the Director within five calendar days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance including exact dates and times, and if the noncompliance has not been corrected the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

- f. **Oil Spill and Chemical Release Reporting:** The Permittee shall comply with all reporting requirements related to the occurrence of oil spills and chemical releases by contacting the National Response Center (NRC) at (800) 424-8802, (202) 267-2675, or through the NRC website <http://www.nrc.uscg.mil/index.htm>.
- g. **Other Noncompliance:** The Permittee shall report all instances of noncompliance not reported under paragraphs Part 17, Paragraph 17(b) or Paragraph 17(e) at the time the monitoring reports are submitted. The reports shall contain the information listed in Paragraph 17(e) of Part 17.
- h. **Other information:** Where the Permittee becomes aware that it failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the Permittee shall promptly submit such facts or information to the Director.

## **PART 18. FINANCIAL RESPONSIBILITY**

- 1. **Method of Providing Financial Responsibility:** The Permittee shall demonstrate and maintain continuous compliance with the requirement to maintain financial responsibility and resources to close, plug and abandon the underground injection well(s) covered by this permit. The Director may, on a periodic basis, require the holder of a permit to revise the estimate of the resources needed to plug and abandon the well(s) to reflect changes in such costs and may require the Permittee to provide a revised demonstration of financial responsibility. No substitution of a demonstration of financial responsibility shall become effective until the Permittee receives written notification from the Director that the alternative demonstration of financial responsibility is acceptable.
- 2. **Types of Adequate Financial Responsibility:** Adequate financial responsibility to properly plug and abandon injection wells under the federal UIC requirements must include completed original versions of one of the following:
  - a. a surety bond with a standby trust agreement;
  - b. a letter of credit with a standby trust agreement;
  - c. a fully funded trust agreement; or
  - d. an independently audited financial statement with a Chief Financial Officer's letter.

A surety bond acceptable to the Director shall contain wording identical to EPA's model language and shall be issued by a surety bonding company found to be acceptable to the U.S. Department of Treasury, which can be determined by review of that department's Circular #570, currently available on the internet at <http://fms.treas.gov/c570/c570.html>.

A letter of credit acceptable to the Director shall contain wording identical to EPA's model language and be issued by a bank or other institution whose operations are regulated and examined by a State or federal agency.

A fully funded trust agreement acceptable to the Director shall contain wording identical to EPA's model language. Annual reports from the financial institution managing the trust account shall be submitted to the Director showing the available account balance.

An independently audited financial statement with Chief Financial Officer's letter acceptable to the Director shall contain wording identical to EPA's model language and shall demonstrate the Permittee meets or exceeds certain financial ratios. If this financial instrument is used, it must be resubmitted annually, within 90 days after the close of the Permittee's fiscal year, using the financial data available from the most recent fiscal year.

A standby trust agreement acceptable to the Director shall contain wording identical to EPA's model language. Annual reports from the financial institution managing the standby trust account shall be submitted to the Director showing the available account balance.

3. **Determining How Much Coverage is Needed:** The Permittee when periodically requested to revise the plugging and abandonment cost estimate discussed above must submit 3 current independent plugging and abandonment cost estimates for EPA to accurately determine the likely cost to plug the well(s).
4. **Insolvency:** In the event of:
  - a. the bankruptcy of the trustee or issuing institution of the financial mechanism; OR
  - b. suspension or revocation of the authority of the trustee institution to act as trustee; OR
  - c. the institution issuing the financial mechanism losing its authority to issue such an instrument;

The Permittee must notify the Director in writing, within 10 business days, and the Permittee must establish other financial assurance or liability coverage acceptable to the Director within 60 days after any event specified in (a), (b), or (c) above. The Permittee must also notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor, if named as debtor of a corporate guarantee, must make such a notification as required under the terms of the guarantee.

**PART 19. TABLE OF VALUES FOR CALCULATING MAXIMUM  
ALLOWABLE INJECTION PRESSURE (MAIP)**

<b>Fracture Gradient Area Number</b>	<b>Geographic Description</b>	<b>SG (Specific Gravity)</b>	<b>FG (Fracture Gradient)</b>
1	Sections 6, 7, 8, 17, 18 and the NW, SW and SE quarters of section 5, T9S-R17E	1.015	0.872
2	E2 of section 23, T8S-R17E	1.015	0.737
3	Sections 32 & 33, T8S-R17E	1.015	0.795
4	Sections 19, 20 and the NW and W2NE quarters of section 30, T8S-R17E	1.015	0.778
5	Section 31 and the W2 and the W2E2 of section 29, S2 and the E2NE of section 30, T8S-R17E	1.015	0.744
6	Sections 21, 28 and the E2E2 of section 29, T8S-R17E	1.015	0.767
7	Section 27, T8S-R17E	1.015	0.739
8	S2 and NE quarter of section 22, NW quarter of Section 23, T8S-R17E	1.015	0.761
9	NW quarter of section 22, T8S R17E	1.015	0.755
10	Section 3, and the S2S2, E2NE, N2SW of section 4, and N2N2 of section 9, T9S- R17E	1.015	0.802
11	NW quarter and W2NE and N2SW of section 4 and NE quarter of section 5, T9S-R17E	1.015	0.820
12	Section 34, T8S-R17E	1.015	0.740
13	Section 35, T8S-R17E	1.015	0.796
14	W2 section 36, T8S-R17E	1.015	0.750
15	E2 of section 36, T8S-R17E	1.015	0.727
16	N2 of Section 31, T8S-R18E	1.015	0.741
17	S2 of section 31, T8S-R18E	1.015	0.748
18	W2 and W2E2 of section 2, T9S-R17E	1.015	0.852
19	Section 1 and E2E2 of section 2 of T9S- R17E and section 6 of T9S-R18E	1.015	0.764
20	Section 5, T9S-R18E	1.015	0.760
21	Section 33, T8S-R18E	1.015	0.736
22	Section 4, T9S-R18E	1.015	0.758
23	Section 8, T9S-R18E	1.015	0.758
24	S2 and S2N2 of section 9, T9S-R17E	1.015	0.825

25	W2 and W2E2 of section 10, T9S-R17E	1.015	0.760
26	Section 11, 12 and the E2E2 of section 10, T9S-R17E	1.015	0.750
27	Section 16, and S2 of section 15 of T9S-R17E	1.015	0.791
28	N2 of section 15, T9S-R17E	1.015	0.804
29	Section 14, T9S-R17E	1.015	0.764
30	N2 Section 13, T9S-R17E	1.015	0.754
31	S2 Section 13, T9S-R17E	1.015	0.867
32	Section 7, T9S-R18E	1.015	0.737
33	Section 9, T9S-R18E	1.015	0.739
34	Section 18, T9S-R18E	1.015	0.700
35	Section 17, T9S-R18E	1.015	0.655
36	Section 32, T8S-R18E	1.015	0.808
37	Sections 19 and 30 of T8S-R18E	1.015	0.722
38	Section 34 of T8S-R18E	1.015	0.655
39	Section 35 of T8S-R18E	1.015	0.655
40	Sections 21 and 28 of T9S-R17E	1.015	0.856
41	Sections 22 and 27 of T9S-R17E	1.015	0.773
42	Sections 19 and 30 of T9S-R17E	1.015	0.708
43	Sections 20 and 29 of T9S-R17E	1.015	0.723
44	Section 29 of T8S-18E	1.015	0.738
45	SW quarter of section 23, T8S-R17E	1.015	0.728
46	W2 of section 24, T8S-R17E	1.015	0.664
47	E2 of section 24, E2, E2E2W2, and E2W2E2W2 of section 25, T8S-R17E.	1.015	0.723
48	Section 26 of T8S-R17E	1.015	0.787
49	W2W2 and E2W2W2W2 of section 25, T8S-R17E	1.015	0.751
50	Sections 20, 21, and 28 of T8S-R18E	1.015	0.699
51	Sections 25, 26 and 27 of T8S-R18E	1.015	0.739
52	Section 36 of T8S-R18E and section 31 of T8S-R19E	1.015	0.655
53	Sections 23, 24, 25 and 26 of T9S-R17E	1.015	0.690
54	Sections 19, 20, 29 and 30 of T9S-R18E	1.015	0.655
55	Sections 21, 22 and 28 of T9S-R18E	1.015	0.655
56	Sections 15 and 16 of T9S-R18E	1.015	0.655
57	Sections 23 and 24 of T9S-R18E	1.015	0.655
58	Sections 13 and 14 of T9S-R18E	1.015	0.655
59	Sections 2 and 3 of T9S-R18E	1.015	0.655

60	Sections 10 and 11 of T9S-R18E	1.015	0.655
61	Section 1 of T9S-R18E and Section 6 of T9S-R19E	1.015	0.655
62	Section 12 of T9S-R18E and section 7 of T9S-R19E	1.015	0.655
63	N2 of Section 17 and N2 of Section 18, T9S-R19E	1.015	0.655
64	Sections 4 and 5 of T9S-R19E	1.015	0.655
65	Sections 8 and 9 of T9S-R19E	1.015	0.655